

Photoinduced magneto-optical Kerr effect in a $\text{Pr}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$ crystal.

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The detailed magneto-optical Kerr effect and ellipsometry measurements on $\text{Pr}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$ have been performed in the energy range of 0.7 - 4.2 eV. The temperature dependences of the magneto-optical Kerr rotation and ellipticity show noticeable effect below $T_N \sim 150$ K and a steep increase below $T_{CA} \sim 110$ K when the canted AF phase develops. It was found that the main feature at ~ 3.4 eV observed in both the diagonal and off-diagonal conductivity increases by about 25 % in the Kerr rotation after illumination by light of YAG laser (the second harmonic, $\lambda = 0.53\mu\text{m}$) at low temperature ($T = 30\text{K}$) and becomes comparable with that measured on the fully polarized half-metallic $\text{La}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$ crystal ($\theta_K \sim 0.5$ deg). The effect is discussed in terms of the collective photoinduced switching behavior associated with the charge-ordering insulator - ferromagnetic metal instability in the manganites.

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